



Coastal Geomorphology and Vulnerability to Tsunamis in Apulia Region (southern Italy)

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The growing urbanization of coastal area rises the risk linked to low frequency - high magnitude events, like tsunamis, which are rarely taken into account by planners. Present-day research focuses mainly on the tsunami hazard assessment, linked to the frequency and intensity of these catastrophic events. However, tsunamis can have very different effects in response to different morphological types of coasts. Aiming to define coastal vulnerability along the Apulian coast (southern Italy), the effects of tsunami on different types of coast have been inferred from the available post-report events integrated by information gathered from the geological research on deposits and forms which have been related to tsunami action.

The most vulnerable are pocket beaches bordered landward by high cliffs which produce very high run-up values; rockfalls from the cliff face impede people to move inland. Beaches are effectively overwashed by tsunami wave, with intense erosion of beach and dune materials which are brought farther inland; erosional scarps form on beaches and foredunes and some distinct sandy layers can be deposited. Where a coastal barrier divides a lagoon by the open sea, washover fans can form at its landward border; the lagoon is inundated by salt water which prevent people to escape inland. River mouths represent a fairly large entrance for tsunamis; extensive damage on river banks is produced by tsunami hitting at an angle the coast. Finally, rocky platforms placed close to the sea level are strongly affected by tsunami which determine the reshaping of these landforms, with extensive carving and deposition of large

boulders. Tsunami effects on unstable cliffs have not been investigated, even if some retreat due to mass movements could be expected

This analysis allowed the vulnerability of different type of coasts occurring in Apulia region to be assessed. The study reveals that that more than half of the Apulian coast is marked by a very low or low vulnerability to tsunami action (57%) whereas about a quarter (21%) shows a high or very high vulnerability.